भारतीय मानक
Indian Standard

IS 9225 : 2018

बाइसिक्ल — बाइसिक्ल हवा पम्प — विशिष्टि

(पहला पुनरीक्षण)

Bicycle — Bicycle Air Pumps — Specification

(First Revision)

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[Bicycles Sectional Committee, TED 16]

FOREWORD

This Indian Standard (First Revision) was adopted by Bureau of Indian Standards, after the draft finalized by the Bicycles Sectional Committee and with the approval of the Transport Engineering Division Council.

This standard was first published in 1979. The revision of this standard has been taken up to incorporate strength test and updating of existing requirements specified.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

BICYCLE — BICYCLE AIR PUMPS — SPECIFICATION

(First Revision)

1 SCOPE

Covers the requirements of manually operated bicycle air pumps used for inflating the tube and tyre.

2 REFERENCES

The following Indian Standards contain provisions, which through reference in this text, constitute provisions of the standards. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

IS No.	*Title*
280 : 2006	Mild steel wire for general engineering purposes (*fourth revision*)
319 : 2007	Free cutting brass bars, rods and section — Specification (*fifth revision*)
446 : 1987	Rubber air hose — Specification (*fourth revision*)
532 : 2006	Bicycle tube valves and valve-tubing — Specification (*third revision*)
620 : 1985	Specification for wooden tool handles general requirements (*fourth revision*)
1068 : 1993	Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium (*third revision*)
2039 : 1991	Steel tubes for bicycle and cycle rickshaws (*second revision*)
2500 (Part 1) : 2000	Sampling procedures for inspection by attributes: Part 1 Sampling scheme indexed by Acceptable Quality Level (AQL) for Lot-by-Lot inspection (*third revision*)
3020 : 1976	Specification for leather for oil seals (*first revision*)
7906 (Part II) : 1975	Helical compression springs : Part II Specification for cold coiled springs made from circular section wire and bar

3 TYPES — Two types of bicycle air pumps are covered as given below:

a) Hand held pump (hand pump)
b) Foot held pump (foot pump)

NOTE — Two sizes of foot pump are covered.

4 MATERIALS

4.1 Barrel for foot pump and plunger, barrel and handle for hand pump shall be made from tubes of either cold drawn seamless or electrically resistance butt welded and shall conform to the requirements laid down in IS 2039. Plunger for hand pump may also be made from close joint tube.

4.1.1 If agreed to between the purchased and the manufacturer, barrel for air pumps may also be made from rigid polyvinyl chloride (PVC), acetal copolymer or high density polyethylene.

4.2 Plunger for foot pumps shall be made from mild steel rod in accordance with IS 280 or tube of either cold drawn seamless or electrically resistance butt welded as specified in IS 2039.

4.3 Handle for foot pump may either be made from hard wood or steel tube.

4.3.1 Steel tube handle shall either be cold drawn seamless or electrically resistance butt welded as specified in IS 2039.

NOTE — Suitable hard wood for handle is specified in IS 620.

4.4 Leather for plunger leather cup shall be vegetable tanned leather as specified in IS 3020.

4.5 Rubber hose shall be type 1 as specified in is 446.

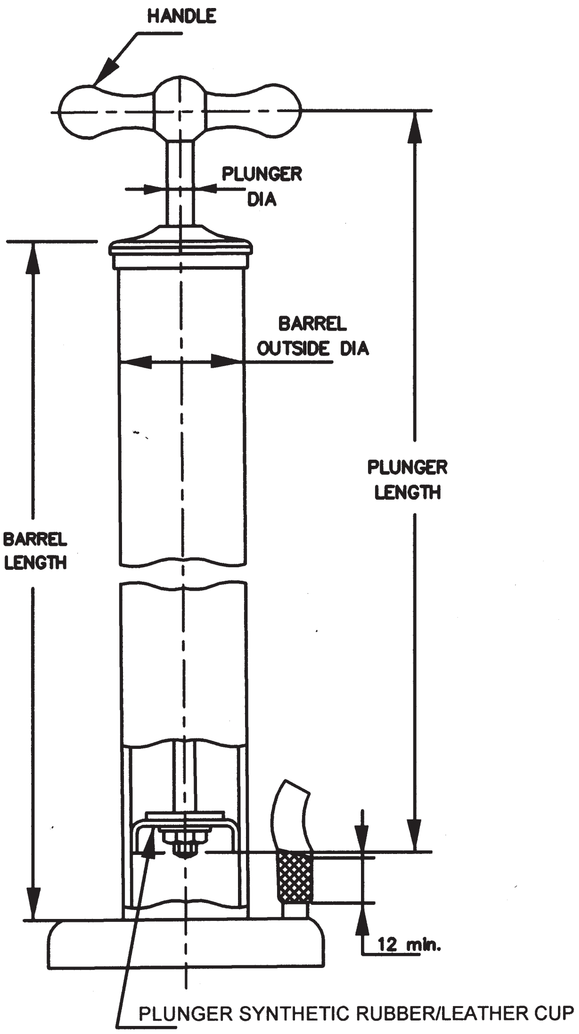
4.6 Connector, when made of brass, shall conform to IS 319.

5 DIMENSIONS

5.1 Dimensions of foot pump and hand pump shall be as given in Fig. 1 and 2 and dimensions of connector as in Fig. 3.

5.2 Dimensions of tubes specified in Fig. 1 and 2 shall be in accordance with IS 2039.

5.3 Thickness of tubes used in bicycle air pump shall not be less than 0.5 mm.



Designation	Barrel Length	Barrel Outside Diameter	Plunger Dia	Plunger Length
Size A	375	28.5	8	410
Size B	500	38.1	10	550

All dimensions in millimetres.

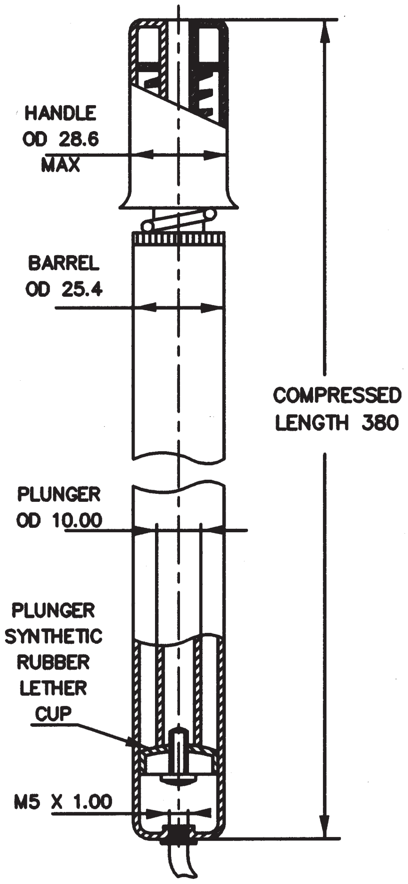
FIG. 1 FOOT PUMP

5.4 Rubber hose for foot pump shall be of diameter 5 mm and of length not less than 600 mm.

6 DESIGNATION

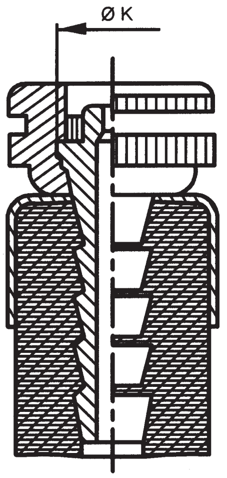
Bicycle air pump shall be designated by the name, type of pump, size of pump (in case of foot pump) the type of connector and the number of this standard.

Example – A bicycle air pump of foot type size A and connector type A shall be designated as: Bicycle Air Pump – Foot pump, Size A, Connector A, IS 9225



All dimensions in millimetres.

FIG. 2 HAND PUMP



Designation	*K*
Size A	Φ 5.23 × 1.06 Pitch
Size B	Φ 7.7 × 0.794 Pitch

Note — The screw threads are withworth truncated threads.

All dimensions in millimetres.

FIG. 3 CONNECTOR

Example – A bicycle air pump of hand type and connector type B shall be designated as: Bicycle Air Pump – Hand Pump Connector B, IS 9225.

7 MANUFACTURE

7.1 Barrel Cap Assembly

Barrel cap assembly to the barrel shall be such as would facilitate the easy removal of the plunger rod and cap assembly for replacement of cap. The cap shall have an integral plunger guide with an effective guide length of not less than 3 mm for hand pumps and 12 mm for foot pumps. The cap may be suitably finished on the outside to provide a non-slip grip during removal.

7.2 Barrel Base

The metal base of the barrel shall be of robust construction, firmly attached to the barrel and shall not break or otherwise fail when tested as described in **10.4.** The base for foot pumps shall have extension on two opposite sides suitable for holding the pump upright with both feet. These may be provided as integral parts of the base or of the folding type.

7.3 Plunger Assembly

The leather cup and plunger assembly shall be so constructed as to prevent collapse of the cup or leakage of air past the cup when the plunger is worked down against the pressures stipulated in **8.5.** The plunger shall be provided with two compression springs fitted on the plunger rod, on either side of the barrel cap to cushion the upward and downward strokes of the pump.

7.4 Connector

The connector shall be of the knurled screw on type suitable for the plug dimensions of the valves specified in IS 532.

7.4.1 Two types of connectors are covered as given below:

Type A – Suitable for woods tube valve

Type B – Suitable for the Schrader tube valve

Note — The supply of connector Type B shall form part of the agreement between the purchaser and the supplier.

7.5 Springs

The springs provided shall conform to IS 7906 (Part 2) and shall have suitable stiffness to protect the plunger from damage against normal pressure exerted on the handle.

8 GENERAL REQUIREMENTS

8.1 All steel tubes used in the manufacture shall be straight and free from burrs and internal surface irregularities.

8.2 Finish

Unless otherwise specified by the purchaser, the exterior surfaces of the barrel, barrel base, barrel cap, metal handle of foot pump and external surfaces of hand pump shall be either painted or plated suitable for protecting the metal against corrosion. The wood handle shall be smooth and suitably painted.

8.3 The painted parts after salt solution test (*see* **10.1**) shall be free from softening, peeling or discoloring on the coated film.

8.4 The plating shall firmly adhere to the base metal and shall be non-porous. A thickness of 0.01 mm is recommended.

8.5 Performance

Each foot pump and hand pump shall be capable of developing the following pressures:

Hand pump – 0.3 MPa, Min
Foot pump – 0.7 MPa, Min

9 SAMPLING

9.1 Unless otherwise agreed to between the supplier and the procedure as given in IS 2500 (Part 1) shall be followed for sampling inspection.

9.2 The sampling plan to be followed for visual and dimensional characteristics shall be corresponding to acceptable quality level (AQL) value of 4 percent given in Table 2 of IS 2500 (Part 1).

9.3 The sampling plan to be followed for tests shall be corresponding to acceptable quality level (AQL) value of 1.5 percent given in Table 2 of IS 2500 (Part 1).

10 TESTS

10.1 Salt Solution Test

The painted parts shall be kept immersed for an hour in a 5 percent common salt solution at the temperature specified below to determine conformance with requirements of **8.3**.

Black enamel paint 80°C
Other enamel paint 60°C

10.2 Corrosion Test

Nickel-chromium plated parts shall be subjected to the corrosion test for service Grade No. 1 as specified in IS 1068 to determine conformance to the requirement of **8.4**.

10.3 Air Leakage Test

There shall be no air leakage at the connector joints or at the plunger cup when the pump is operated against the pressure indicated in **8.5**. For the purpose of this test, a cycle tube inflated to the specified pressure should be used.

10.4 Strength Test

The strength of operation parts of the pump shall be as follows:

10.4.1 *Strength of frame pump*

With the cylinder barrel of a frame pump fixed as shown in Fig. 4, when pull out the piston rod by 50mm, a load of 49 N (5 kgf) is gently applied to the grip at a point of 50 mm from the end for 1 min, there shall be no bend of the piston rod or fault of the grip.

10.4.2 *Strength of foot pump*

When a load of 1 470 N (150 kgf) is gently applied for 1 min, to the grip of the foot pump as shown in Fig. 5, there shall be no fracture of the grip.

The load shall include the mass conversion of the loading devices, and the test temperature shall be the ordinary temperature (5°C to 35°C).

10.4.3 *Piston rod to pump grip joining strength*

When a tensile load of 980 N (100 kgf) is applied to the piston rod of foot pump for 1 min as shown in Fig. 6, there shall be no loosening or removal between the piston rod and the pump grip.

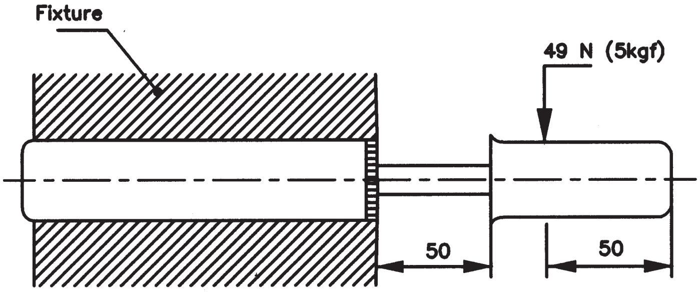
11 MARKING

11.1 The pump shall be permanently marked with the name of the manufacturer or their registered trade-mark.

11.2 BIS Certification Marking

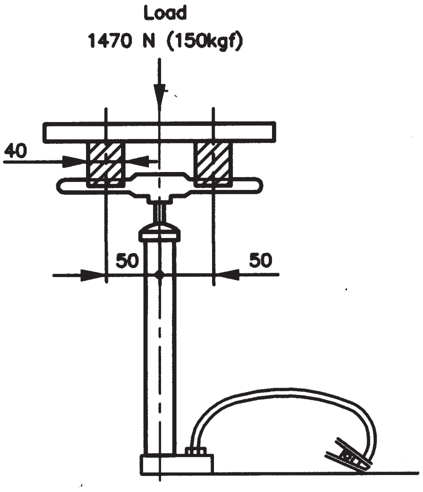
The bicycle air pump may also be marked with the Standard Mark.

11.2.1 The use of Standard Mark is governed by the provisions of *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The detail of conditions under which the licence for use of Standard Mark may be granted to manufacturers or producers may be obtained from Bureau of Indian Standards.



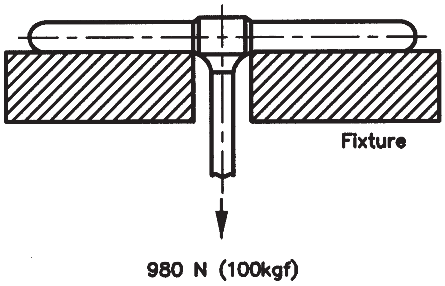
All dimensions in millimetres.

FIG. 4 STRENGTH TEST OF FRAME PUMP



All dimensions in millimetres.

FIG. 5 STRENGTH TEST OF FOOT PUMP



All dimensions in millimetres.

FIG. 6 PISTON ROD TO PUMP GRIP JOINING STRENGTH

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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